CLAIMS:

1. A system for mounting a vehicle wheel having an axial pilot hole and a plurality of radially spaced lug holes in an axially centered configuration about a spindle shaft of a vehicle wheel balancer, comprising:

a mounting flange assembly configured for placement on the spindle shaft, said mounting flange assembly including a flange plate and a plurality of mounting pins, each of said plurality of mounting pins including a guide pin adapted for engagement with said mounting flange and a contact tip adapted for engagement with the plurality of radially spaced lug holes; and

wherein said mounting flange assembly is configured to provide infinite radial adjustment of said contact tips about the spindle shaft between a minimum radial dimension and a maximum radial dimension to engage the plurality of radially spaced lug holes.

2. The system of Claim 1 further including a set of double-tapered centering cones, each of said double-tapered centering cones configured for placement on the spindle shaft and having an identifying indicia.

3. The system of Claim 1 for mounting a vehicle wheel wherein said mounting flange assembly further includes an adjusting plate rotationally coupled to said flange plate, said adjusting plate and said flange plate cooperatively defining a plurality of radially spaced unobstructed passages configured to receive said mounting pin guide pins; and

wherein rotational movement of said adjusting plate relative to said flange plate alters a radial position of each of said unobstructed passages.

4. The system of Claim 1 for mounting a vehicle wheel wherein said mounting flange assembly further includes a plurality of adjacent discrete detent positions configured to receive said mounting pins; and

wherein each of said plurality of mounting pins further includes a radially compliant tip.

5. The system of Claim 4 for mounting a vehicle wheel wherein each of said radially compliant tips includes a spherical contact tip coupled to said mounting pin on a ball and socket joint configured for limited articulation.

6. The system of Claim 4 for mounting a vehicle wheel wherein each of said radially compliant tips includes an axially restrained tip configured for a limited range of radial compliance.

7. The system of Claim 4 for mounting a vehicle wheel wherein each of said radially compliant tips is configured with a limited range of radial compliance, and wherein each limited range of radial compliance overlaps a limited range of radial compliance associated with a mounting pin in an adjacent discrete detent position.

8. A method for the centered mounting of a vehicle wheel having an axial pilot hole and a plurality of lug holes upon a balancer spindle, comprising:

selecting a centering cone having an outer tapered surface with a diameter corresponding to a diameter of the vehicle wheel axial pilot hole;

disposing said selected centering cone on the balancer spindle;

disposing said vehicle wheel on the balancer spindle such that an inner surface of said vehicle wheel axial pilot hole seats on said selected centering cone;

securing a plurality of mounting pins in a mounting flange, a number and annular spacing of said plurality mounting pins corresponding to a number and annular spacing of the plurality of vehicle wheel lug holes;

adjusting contiguously a radial spacing of said plurality of mounting pins to correspond to a radial spacing of the plurality of vehicle wheel lug holes, said adjustment ;

disposing said mounting flange axially on said balancer spindle;

engaging each of the plurality of vehicle wheel lug holes with a corresponding mounting pin on said mounting flange; and

clamping said centering cone, vehicle wheel, and mounting flange with a clamp engaged on said balancer spindle.

9. A centering cone for mounting a rotating body on a shaft, comprising:

a central hole in said centering cone for axially guiding said centering cone on said shaft;

a first tapered outer surface having a first minimum diameter adjacent a first end of said centering cone;

a second tapered outer surface having a second minimum diameter adjacent a second end of said centering cone, opposite said first end; and

at least one identifying indicia disposed on a surface of said centering cone.

10. The centering cone of Claim 9 wherein said at least one identifying indicia includes at least one circumferential groove disposed between a first maximum diameter and a second maximum diameter.

11. The centering cone of Claim 10 wherein said at least one circumferential groove is colored.

12. The centering cone of Claim 10 wherein said at least one identifying indicia includes a plurality of circumferential grooves disposed between said first and second maximum diameters.

13. The centering cone of Claim 9 wherein said at least one identifying indicia includes at least one annular channel disposed on an end face of said centering cone, said at least one annular channel concentric with said central hole.

14. The centering cone of Claim 13 wherein said at least one annular channel is colored.

15. The centering cone of Claim 13 wherein said at least one identifying indicia includes a plurality of annular channels disposed on an end face of said centering cone, each of said plurality of annular channels concentric with said central hole.

16. A method for selecting a centering cone from a set of centering cones for use in mounting a vehicle wheel on a vehicle wheel balancer spindle, each of said centering cones in said set having a double-tapered outer surface and at least one identifying indicia unique within said set, comprising:

identifying one or more characteristics associated with said vehicle wheel; and

correlating said one or more identified characteristics with a plurality of predetermined dimensions for said centering cones in said set of centering cones to identify a matching centering cone.

17. The method of Claim 16 for selecting a centering cone wherein said step of identifying one or more characteristics associated with said vehicle wheel includes identifying a pilot hole inner diameter of said vehicle wheel.

18. The method of Claim 16 for selecting a centering cone wherein said step of identifying one or more characteristics associated with said vehicle wheel includes identifying one or more characteristics of a vehicle with which said vehicle wheel is associated.

19. The method of Claim 16 for selecting a centering cone further including the steps of:

displaying said identifying indicia corresponding to said identified matching centering cone; and

selecting a centering cone from said set of centering cones having said displayed identifying indicia.

20. An adjustable mounting flange for mounting a variety of vehicle wheels having different lug patterns on the shaft of a balancing machine which comprises:

a flange plate having a central bore extending from a front face to a rear face;

an adjusting plate disposed adjacent said rear face and coupled to said flange plate for coaxial rotational movement relative to said flange plate;

a plurality of slots passing through said flange plate;

a plurality of slots passing through said adjusting plate; and

wherein said plurality of slots and said plurality of arcuate slots cooperatively define one or more sets of unobstructed passages through said adjustable mounting flange; and

wherein each of said unobstructed passages in a set of unobstructed passages is disposed at a common radial distance from an axis of said central bore, said common radial distance associated with a rotational position of said adjusting plate about said annular hub.

21. The adjustable mounting flange of Claim 20 wherein said plurality of slots passing through said flange plate include at least one set of circumferentially equidistant spaced slots, said slots in said set having a common configuration selected from a set of configurations including radial, arcuate, or skewed; and

wherein said plurality of slots passing through said adjusting plate include at least one set of circumferentially equidistant spaced slots, said slots in said set having a common configuration selected from a set of configurations including radial, arcuate, or skewed.

22. The adjustable mounting flange of Claim 20 wherein each of said unobstructed passages is configured to receive a mounting pin.

23. The adjustable mounting flange of Claim 20 wherein a range of rotational movement of said adjusting plate about said central axis corresponds with a range of radial movement of each of said unobstructed passages in said set of unobstructed passages between an inner radial position and an outer radial position.

24. The adjustable mounting flange of Claim 20 wherein one or more subsets of said slots are disposed in annular patterns corresponding to annular patterns of vehicle wheel lug holes.

25. The adjustable mounting flange of Claim 24 wherein an identifying indicia is associated with each of said slots comprising one of said one or more subsets.

26. A method for securing a vehicle wheel having a plurality of lug holes on the spindle of a balancing machine with an adjustable mounting flange of Claim 20, comprising the steps of:

identifying a lug hole pattern on the vehicle wheel;

rotationally aligning said adjusting plate with said flange plate such that said plurality of slots and said plurality of arcuate slots cooperatively define a set of unobstructed passages through said adjustable mounting flange corresponding to said identified lug hole pattern;

installing a plurality of mounting pins in each unobstructed passage in said set of unobstructed passages;

mounting said adjustable mounting flange on the balancer spindle;

aligning each of said plurality of mounting pins with a lug hole; and

urging said mounting flange towards said vehicle wheel, engaging each of said plurality of mounting pins with said lug holes, whereby said vehicle wheel is centrally secured about said balancer spindle.

27. The method of Claim 26 for securing a vehicle wheel wherein the step of aligning further includes the step of rotating said adjusting plate relative to said flange plate, whereby a radial position of each of said mounting pins is altered.

28. The method of Claim 27 for securing a vehicle wheel wherein each of said mounting pins has a common radial position; and wherein said radial position of each of said mounting pins is altered simultaneously and equally.

29. A mounting flange for mounting a variety of vehicle wheels having different lug patterns on the shaft of a balancing machine which comprises:

a flange plate having an axial bore extending from a front face to a rear face;

a plurality of slots passing through said flange plate, each of said slots associated with two or more discrete detents, each of said two or more discrete detents defining a predetermined radial position from said axial bore.

30. The mounting flange of Claim 29 wherein each of said discrete detents is disposed on said rear face of said flange plate adjacent said associated slot.

31. The mounting flange of Claim 29 wherein each of said discrete detents is disposed on an inner surface of said associated slot.

32. The mounting flange of Claim 29 wherein one or more subsets of said plurality of slots are annularly disposed on said flange plate to correspond with one or more vehicle wheel lug hole annular patterns.

33. The mounting flange of Claim 32 wherein at least one slot is common to each of said one or more subsets.

34. The mounting flange of Claim 32 wherein each of said slots in said one or more subsets has a common minimum radial displacement discrete detent and a common maximum radial displacement discrete detent.

35. The mounting flange of Claim 29 wherein one or more subsets of said plurality of slots have a common configuration selected from a set of configurations including radial, arcuate, or skewed.

36. The mounting flange of Claim 29 further including a guide plate coaxial with said flange plate, said guide plate including a plurality of guide holes disposed in one or more predetermined vehicle wheel lug patterns, said plurality of guide holes aligned with a subset of said plurality of slots.

37. A mounting flange for mounting a variety of vehicle wheels each having different lug hole patterns on the shaft of a balancing machine which comprises:

a flange plate having a central bore extending from a front face to a rear face;

a plurality of sets of mounting pin receiving bores, each of said sets of mounting pin receiving bores including a plurality of adjacent mounting pin receiving bores passing through said flange plate.

38. The mounting flange of Claim 37 wherein each mounting pin receiving bore in said plurality of adjacent mounting pin receiving bores overlaps at least one adjacent mounting pin receiving bore.

39. The mounting flange of Claim 37 wherein subsets of said plurality of sets are annularly disposed in predetermined relationships corresponding to at least one vehicle wheel lug hole pattern.

40. The mounting flange of Claim 39 wherein an identifying indicia is associated with each of said subsets.

41. The mounting flange of Claim 37 wherein each of said sets of mounting pin receiving bores includes a plurality of adjacent mounting pin receiving bores disposed about a common radial line from an axis of said central bore.

42. The mounting flange of Claim 37 wherein each of said sets of mounting pin receiving bores includes a plurality of adjacent mounting pin receiving bores disposed about a common arcuate line from an axis of said central bore.

43. The mounting flange of Claim 37 wherein each of said sets of mounting pin receiving bores includes a plurality of adjacent mounting pin receiving bores disposed about a common skewed line from an axis of said central bore.

44. A mounting pin for engaging a vehicle wheel lug hole, comprising:

a longitudinal shaft having an axis and first and second ends;

an annular base disposed about said shaft adjacent said first end;

a sleeve disposed about said shaft adjacent said second end;

a guide pin disposed in proximity to said first end;

a contact tip disposed in proximity to said second end; and

wherein said guide pin further includes at least one retaining tab, said at least one retaining tab disposed perpendicular to said axis.

45. The mounting pin of Claim 44 wherein said guide pin further includes a guide segment, said guide segment disposed opposite said retaining tab from said annular base.

46. The mounting pin of Claim 44 wherein said retaining tab is a spring tab.

47. The mounting pin of Claim 46 wherein said spring tab has a width not greater than a diameter of said guide pin, and a length not less than said width.

48. The mounting pin of Claim 46 wherein said spring tab includes at least one longitudinal crease, said spring tab resiliently biased in an axial direction.

49. The mounting pin of Claim 44 wherein said contact tip is integral with said sleeve; and

wherein said sleeve is removable from said longitudinal shaft.

50. The mounting pin of Claim 44 wherein said guide pin is integral with said longitudinal shaft.

51. The mounting pin of Claim 44 wherein said at least one retaining tab has a width not greater than a diameter of said base segment, and a length not less than said width.

52. A mounting pin for engaging a vehicle wheel lug hole, comprising:

a longitudinal shaft having an axis and first and second ends;

an annular base disposed about said shaft adjacent said first end;

a sleeve disposed about said shaft adjacent said second end;

a guide pin disposed in proximity to said first end; and

a contact tip disposed in proximity to said second end, said contact tip configured to be radially compliant within a limited range about said axis.

53. The mounting pin of Claim 52 wherein said contact tip is configured for articulating motion.

54. The mounting pin of Claim 53 wherein said contact tip is removably coupled to said sleeve on a ball and socket joint.

55. The mounting pin of Claim 53 wherein said contact tip includes a hemispherical contact surface.

56. The mounting pin of Claim 52 wherein said sleeve includes an axial bore, and said contact tip includes an annular hub disposed within said axial bore, said annular hub configured to limit a range of radial compliance for said contact tip.

57. The mounting pin of Claim 56 wherein said contact tip is removably coupled to said sleeve with an axially resilient member.

58. The mounting pin of Claim 57 wherein said axially resilient member is a spring, said spring coupled between said contact tip and said sleeve within said axial bore.

59. The mounting pin of Claim 57 wherein said axially resilient member includes at least one magnet, said magnet disposed to exert an axial restraining force on said contact tip.

60. A mounting assembly for mounting a variety of vehicle wheels each having different lug hole patterns on the shaft of a balancing machine which comprises:

a mounting flange plate disposed on the shaft of the balancing machine, said mounting flange plate having a central bore extending from a front face to a rear face and a plurality of sets of mounting pin receiving bores, each of said sets of mounting pin receiving bores including a plurality of adjacent mounting pin receiving bores passing through said mounting flange plate; and

a set of mounting pins configured for engaging a corresponding set of vehicle wheel lug holes, each of said mounting pins in said set including a contact tip configured to be radially compliant within a limited range about an axis of said mounting pin; and

wherein said plurality of adjacent mounting pin receiving bores and said radially compliant contact tips are cooperative to provide infinite radial adjustment within a predetermined range of lug hole pattern diameters.